US Army Natick Soldier RD&E Center (NSRDEC)

National Protection Center (NPC)

The Science Behind the Soldier: Yesterday, Today and Tomorrow

US ARMY RDECOM

US ARMY NATICK SOLDIER RD&E CENTER

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National Protection Center

A DoD focal point for the advancement of individual and integrated personal protection. Leveraging Military Technology with applications for public safety, Homeland Defense and Homeland Security.

Personal Protection

Multifunctional Integrated Systems

Unique partnerships: DoD, Department of Homeland Security, National Institute of Standards and Technology, National Institute of Justice (NIJ), OGA, industry and academia

National Protection Center (NPC)

Technical Expertise for Military & Civilian Emergency Responders

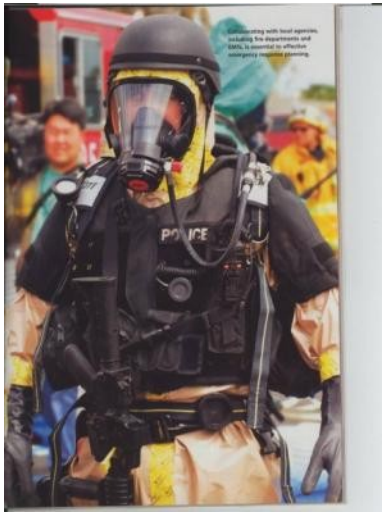
- **National Focal Point**
  - Establish RDT&E teams to address PPE for Homeland Security Operations
  - Promote technology integration, interoperability, dual-use standards
  - Support national high-priority homeland security PPE initiatives for military and civilians or in other high-risk activities
  - Support tech transfer related technology policies and procedures
  - Assess projects of high dual-user [illegible]ance
  - Identify shared/leveraged techno[illegible]gy and knowledge investments

- **Partners**
  - Department of Homeland Security
  - National Institute of Justice
  - Other Government Organizations: Federal, State, Local

NPC Programs

On-going and Recent efforts:

- Law Enforcement CB Protective Ensembles
- Explosive Ordnance Device (EOD) Protection
- Microclimate Cooling Systems/Test Method validation
- Integrated Head Protection
- LE Duty Uniforms
- Advanced Personal Protection System
- SAVER Boot Evaluation
- Explosive Countermeasures
- Position Location and Tracking
- Personal Water Filtration
- CWA Simulants
- Micro Gas Analyzer
- TCIP Conference



Law Enforcement Advanced Protection (LEAP) Program Overview

- **Description**:
  - Address LE PPE needs by applying a System-of-Systems (SoS) / Human Systems Integration (HSI) approach
  - Focal point for integration of DHS, DoJ/NIJ S&T, RDT&E activities to address HLD/S needs
- **Activities**
  - Analysis and development of performance standards
  - Define performance requirements of integrated protective ensembles for LE practitioners (Federal, State, Local, and Tribal)
  - Develop proposed criteria for LE PPE standards development (Duty Uniform, MCC, EOD, CB)
  - Collect test data to support the advancement of LE PPE standards
  - Perform RDT&E to meet PPE needs of the HLS community

360° Protection

DHS Standards
LEAP: Duty Uniform

- **Objective:**
  - Develop performance criteria
  - Assess existing standards and test methods
  - Examine the need for multi-hazard protection
    - e.g. Flame, blood borne pathogens, cut/slash resistance, and durability to weather exposure

- **Deliverables:**
  - Technical evaluation of DU materials
  - User requirements assessment (HLS)
  - DU Standards Gaps Analysis
  - Final report (Draft Performance Standards Recommendations)

DHS S&T Standards
LEAP: Micro-Climate Cooling (MCC)

- **Objective:**
  - Define law enforcement needs for MCC
  - Investigate historical cases of heat injury
  - Evaluate frequently purchased commercial MCC systems for use in law enforcement
  - Conduct test methods assessment

- **Deliverables:**
  - Literature review
    - MCC needs
    - Heat injuries
  - Gaps Analysis Report
  - MCC draft standard

DHS Standards, DHS + NIJ S&T LEAP: EOD PPE (Bomb Suit)

- **Objective:**
  - Establish an NIJ Standard for Explosive Ordnance Disposal, Personal Protective Equipment (EOD PPE) containing minimum acceptable performance requirements and test methods
  - Establish guidance for purchasing bomb suits

- **Deliverables:**
  - Benchmark state-of-the-art Bomb Suits
  - Ergonomics testing and user requirements
  - Identification, characterization, and modeling identified threats
  - Establish performance requirements and test methods
  - Provide recommendations for SCAM document

- **Status:**
  - NIJ Special Technical Committee preparing the standard

LEAP: Integrated Head Protection (IHP)

- **Objective**:
  - Conduct state-of-military head protection market assessment
  - Define technology transition opportunities
  - Identify common military-LE IHP requirements

- **Deliverables**:
  - DoD Market Survey
  - DoD IHP program(s) assessments
  - Integrated head protection survey
  - Integrated head protection summit
  - Final Report on Tech Transfer Opportunities

DHS S&T TechSolutions
Advanced Personal Protection System

- **Objective**
  - Improve USCG / Law Enforcement user survivability.
  - Enhance system component interoperability.
  - Maximize user operational effectiveness.
- **Deliverables**
  - Improved/integrated personal protection system.
  - Vetted process for developing and validating personal protection components that can be transitioned to other DHS, law enforcement or first responder users.

DHS S&T TechSolutions Evaluation of First Responder Location Technology

Objectives:

- Assess technology readiness of indoor location & tracking technologies
- Identify and quantify capability gaps for emergency responders

Operational Evaluation:

- Multiple Building Types
- Emergency responder focused scenarios
- Practitioner vetted evaluation plan

Deliverables:

- Determine the direction of future research
- Demonstration and field assessment of 5 tracking systems was conducted and preliminary results presented

DHS S&T TechSolutions
Personal Portable Water Filtration

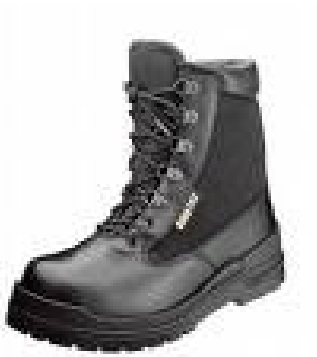
- **Objective:**
  - Develop a method to produce potable water in the event a disaster contaminates local water supplies
  - Phase 1 - Identify and validate a commercial off-the-shelf solution to satisfy the requirement.
  - Phase 2 - If no COTS solution exists, develop a solution using commercial off the shelf technologies.

- **Deliverables:**
  - Program successfully completed.
    - COTS device identified
    - 100 gal production/4-week period
    - Family of 4, 1gal/person/day
    - Shelf life ~10 years
    - Objective cost: less than $50 ($48)
  - Recommendations and documentation provided to NYC OEM.

SAVER Boot Evaluation

Objectives:

Determine the operational suitability and effectiveness of various commercial boots being considered for procurement by law enforcement.



Evaluate five brands of commercial law enforcement boots for:

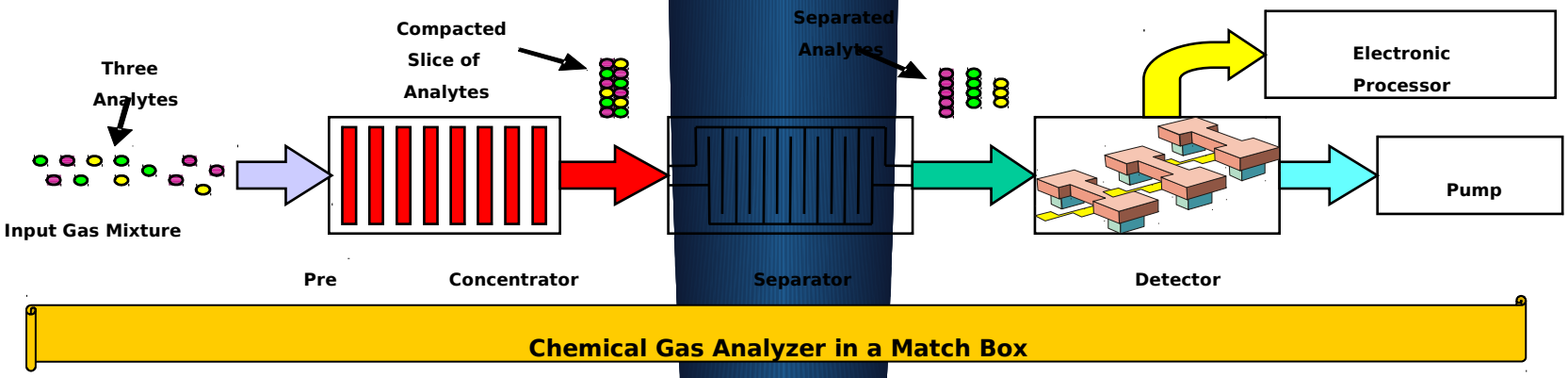
- Capability
- Usability
- Maintainability

Deliverables/Major Accomplishments

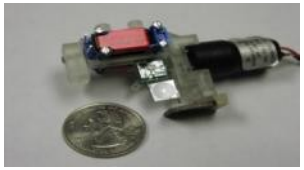
- Boots distributed to 251 users
- Testing completed
- Survey conducted
- Final report submitted

Micro Gas Analyzer

Concept:



Prototype:

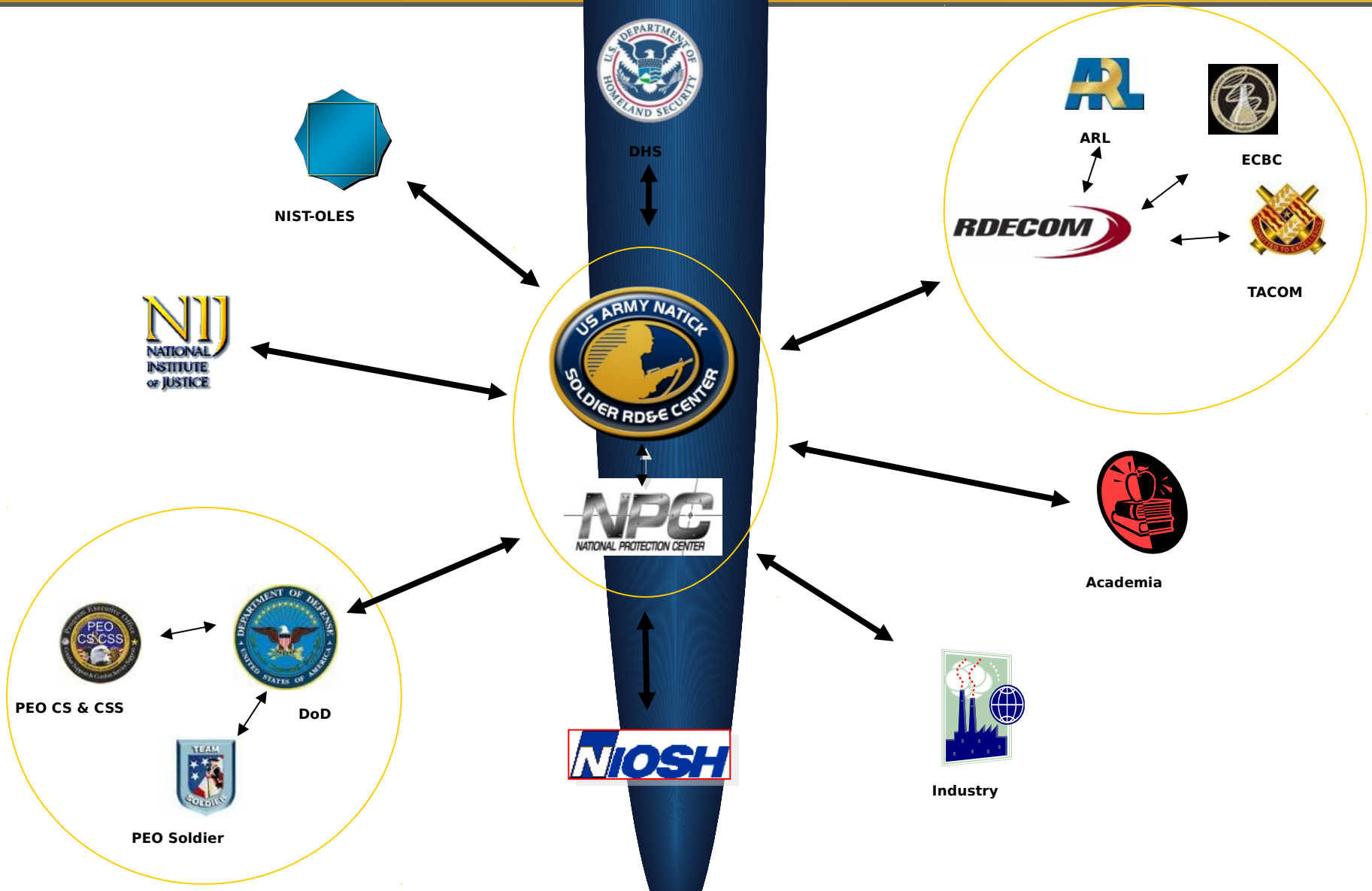


Goal:

Enable remote detection of chemical agents via tiny, ultra-low power, fast, chip-scale gas analyzers that greatly reduce the incidence of false positives

- 4 s separation time for 30 compounds
- Analytical capacity of 1,200
- Energy/analysis <0.5 J (1 J for GC-MS)
- Size <2 cm3
- False alarm rate less than 1 in 107
- Sensitivity <1 ppt

Law Enforcement Advanced Protection Stakeholders



Our Homepage & Other Links

- **NSRDEC Homepage:** nsrdec.natick.army.mil/about/techprog/index.htm
- **TSPID Homepage:** nsrdec.natick.army.mil/about/techprog/index.htm
- **NPC Homepage:** nsrdec.natick.army.mil/npc/index.htm

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Doing Great Things for the Soldier Everyday

…50 Years and Counting

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